

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

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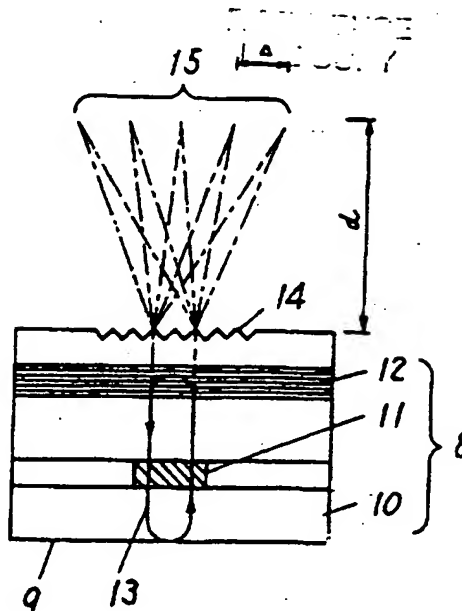
APPLICATION DATE : 08-12-83  
APPLICATION NUMBER : 58231742

APPLICANT : MATSUSHITA ELECTRIC IND CO LTD;

INVENTOR : KOGA KEISUKE;

INT.CL. : H01S 3/18 // G02B 6/26

TITLE : SEMICONDUCTOR LIGHT  
GENERATOR



**ABSTRACT :** PURPOSE: To miniaturize and stabilize the titled generator, and to improve coupling efficiency between a light source and an optical transmission line by using a surface light-emitting semiconductor laser as a semiconductor laser and employing a device consisting of a periodic waveguide, in which a plurality of optical waveguide layers are laminated on an active layer in the surface light-emitting semiconductor laser, as a resonator.

**CONSTITUTION:** A surface light-emitting semiconductor laser has laser oscillation action while using a substrate surface 9 and a laminated type optical waveguide layer 12, which is grown on an active layer 11 in an epitaxial manner and has a diffraction grating function, as both resonator surfaces. Oscillation wavelength can be selected arbitrarily by changing the thickness and refractive index of the laminated type optical waveguide layer 12 having a periodic waveguide within a range of the gains of the active layer 11. Since output signals can be extracted in large areas and under collimating states in the surface light-emitting semiconductor laser, spot size can be reduced when output signal beams are distributed by using a transmission type diffraction grating 14. A resist diffraction grating is prepared on the surface containing a light-emitting region in the surface light-emitting semiconductor laser, and etched, thus transferring the diffraction grating pattern on the light-emitting surface of the surface light-emitting semiconductor laser 8.

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